

September 10, 2020

Attention: Jay Clayton, Chairman
U.S. Securities and Exchange Commission
100 F Street NE
Washington, DC 20549

Letter #5 Re: GSX's Unlucky #8

To Mr. Jay Clayton,

This is a 5th follow-up letter in regards to the unmistakable fraud and market manipulator, GSX Techedu (ticker: GSX), and the lack of action to date by the SEC. As of September 9, 2020, 197 days have elapsed since the SEC was presented with evidence of GSX's fraudulent business practices.

This letter highlights a statistically anomalous frequency of the Chinese lucky number 8 in GSX's stock price, occurring since August 1, 2020.

According to Wikipedia's article on "Chinese Numerology", "The number 8 is viewed [by Chinese] as such an auspicious number that even being assigned a number with several eights is considered very lucky." In fact, it is such an important number to Chinese people at large, that the opening ceremony of the 2008 Summer Olympics in Beijing began on 8/8/08 at 8 minutes and 8 seconds past 8 pm local time.

It has been my and others' suspicion that GSX's Chinese stock price manipulators have recently made a point to force the price such that it includes as many 8's as possible. Whether this is for luck or to signal a proverbial middle finger to American investors and authorities by demonstrating the ease at which they manipulate the stock is of no matter. What is important to note is that the statistical likelihood of these patterns emerging is near impossible, without stock price manipulation.

Three different approaches have been taken to examine the frequency of the number 8 in GSX's stock Open price (after-market and pre-market price manipulations) and stock Close price (trading day manipulations).

1. Frequency of the number "8", anywhere within the stock price (includes cents, e.g., \$xx.xx).
2. Frequency of the number "8", only in the dollars and tens-of-dollars digits (excludes cents, e.g., \$xx).
3. Frequency of the number "8", only in the dollars digit (excludes cents and tens-of-dollars, e.g., \$#x."

The rationale for these three approaches is to tease out any possibility for coincidence. For example, one may argue that GSX's manipulators are unable to finely tune the stock price to the cent level (e.g., \$#.x# or \$#.#x). Although it is believed that they often times can (see figures 4-9, below), I want to eliminate this doubt by running two scenarios that are non-inclusive of cents.

In another example, although GSX's stock price being pegged to the 80's range (\$80.00 - \$89.99) seems to have been fully intentional (see figures 4-9, below), since it requires a substantial \$10 price movement

for the price to not have a 100% “hit rate” of at least one digit containing an 8. For this reason, it was worth analyzing the frequency of 8’s only in the dollars digit (scenario 3).

The timespan for this first part of this letter’s analysis is for all trading days from January 1, 2020 to present, with January 1, 2020 to July 31, 2020 being the “control”, and August 1, 2020 to September 8, 2020 being the “experiment”.

RESULTS

Any digit containing 8:

Any digit containing 8				
	Count	Count of Total Days	Ratio of 8 to non-8 Days	% Increase from Pre-manipulation
Sum of Open "8", August 1 - September 8	25	37	67.6%	281%
Sum of Close "8", August 1 - September 8	27	37	73.0%	303%
Sum of Close or Open "8", August 1 - September 8	31	37	83.8%	191%
Sum of Open "8", January 1 - July 31	33	137	24.1%	
Sum of Close "8", January 1 - July 31	33	137	24.1%	
Sum of Close or Open "8", January 1 - July 31	60	137	43.8%	

Figure 1

As the above table displays, for a count of 37 trading days prior to today, 31 have contained the number 8 in any digit. On 27 of 37 days, GSX opened with an 8 digit and on 27 of 37, it closed with an 8 digit. There were only 10 days (27% of days) in which GSX did not *both* Open and Close with an 8 digit.

By comparison, for the 137 days from January 1, 2020 to July 31, 2020, the frequency of Opens containing an 8 was 24.1% (vs. 67.6% since August), of Closes was 24.1% (vs. 73% since August) and of either Open or Close was 43.8% (vs. 83.8% since August).

The % increase in the frequency of 8’s from January through July compared to August to today is between 191% to 281%. Note that the sample sizes are large enough to be considered statistically significant. In statistical terms, this increase in frequency cannot be explained away as a coincidence.

Excluding cents (only dollars & tens-of-dollars):

Only for tens & dollar digit 8's				
	Count	Count of Total Days	Ratio of 8 to non-8 Days	% Increase from Pre-manipulation
Sum of Open "8", August 1 - September 8	24	37	64.9%	808%
Sum of Close "8", August 1 - September 8	27	37	73.0%	714%
Sum of Close or Open "8", August 1 - September 8	30	37	81.1%	505%
Sum of Open "8", January 1 - July 31	11	137	8.0%	
Sum of Close "8", January 1 - July 31	14	137	10.2%	
Sum of Close or Open "8", January 1 - July 31	22	137	16.1%	

Figure 2

As the above table displays, for a count of 37 days prior to today, 30 days have contained the number 8 in any dollar digit (analysis excludes cents). On 24 days, GSX opened with an 8 digit and on 27, it closed with an 8 digit. There were only 10 days (27% of days) in which GSX did not both open and close with an 8.

By comparison, for the 137 days from January 1, 2020 to July 31, 2020, the frequency of Opens containing an 8 in a dollar digit was 8.0% (vs. 64.9% since August), of Closes was 10.2% (vs. 73% since August) and of either Open or Close was 16.1% (vs. 81.1% since August).

The % increase in the frequency of 8's from January through July compared to August to today is between 505% to 808%. Note that the sample sizes are large enough to be considered statistically significant. In statistical terms, this increase in frequency cannot be explained away as a coincidence.

Excluding cents & tens-of-dollars (only dollars):

Only for dollar digit 8's				
	Count	Count of Total Days	Ratio of 8 to non-8 Days	% Increase from Pre-manipulation
Sum of Open "8", August 1 - September 8	7	37	18.9%	288%
Sum of Close "8", August 1 - September 8	6	37	16.2%	202%
Sum of Close or Open "8", August 1 - September 8	12	37	32.4%	234%
Sum of Open "8", January 1 - July 31	9	137	6.6%	
Sum of Close "8", January 1 - July 31	11	137	8.0%	
Sum of Close or Open "8", January 1 - July 31	19	137	13.9%	

Figure 3

As the above table displays, for a count of 37 days prior to today, 12 days have contained the number 8 in the dollars digit (analysis excludes cents and tens-of-dollars). On 7 days, GSX opened with an 8 digit and on 6, it closed with an 8 digit.

By comparison, for the 137 days from January 1, 2020 to July 31, 2020, the frequency of Opens containing an 8 in a dollar digit was 6.6% (vs. 18.9%), of Closes was 8.0% (vs. 16.2%) and of either Open or Close was 13.9% (vs. 32.4%).

The % increase in the frequency of 8's from January through July compared to August to today is between 202% to 288%. Note that the sample sizes are large enough to be considered statistically significant. In statistical terms, this increase in frequency cannot be explained away as a coincidence.

BENFORD'S LAW

Benford's law, or the law of anomalous numbers, is an observation of the frequency distribution of a leading digit in real-life numerical datasets. GSX's stock price fits the requirements for "real-life numerical datasets" for which to apply Benford's law.

Benford's law argues that the frequency of the number 8 is quite uncommon, relative to other digits. Specifically, the digit 8 should appear as the leading digit only 5.1% of the time – the second least frequent, after 9. By comparison, the digit 1 appears at the first digit ~30% of the time.

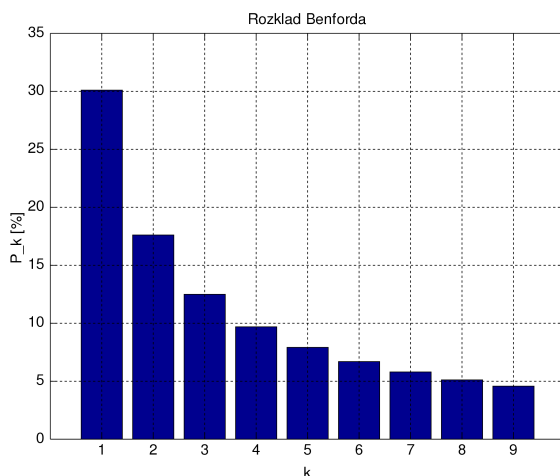


Figure 10. Frequency of first digit according to Benford's law

As Wikipedia states, “It has been shown that this result applies to a wide variety of data sets, including electricity bills, street addresses, **stock prices**, house prices, population numbers, death rates, lengths of rivers, and [physical](#) and [mathematical constants](#).” (Source: https://en.wikipedia.org/wiki/Benford%27s_law)

Benford's law has been utilized countless times **to detect fraud**. For example, the macroeconomic data the Greek government reported to the European Union before entering the eurozone was shown to be likely fraudulent via Benford's law (Source: William Goodman, [The promises and pitfalls of Benford's law](#), *Significance*, Royal Statistical Society (June 2016), p. 38.) and [Goldacre, Ben](#) (16 September 2011). ["The special trick that helps identify dodgy stats"](#). *The Guardian*. Retrieved 1 February 2019).

The study of Benford's law goes on to discuss the frequency of numbers beyond the first digit. In particular, for any given number of digits, the probability of encountering a number starting with the string of digits n of that length – discarding leading zeros – is given by:

$$\log_{10}(n+1) - \log_{10}(n) = \log_{10}\left(1 + \frac{1}{n}\right)$$

The results for the frequency of a number by digit are:

Digit	0	1	2	3	4	5	6	7	8	9
1st	N/A	30.1%	17.6%	12.5%	9.7%	7.9%	6.7%	5.8%	5.1%	4.6%
2nd	12.0%	11.4%	10.9%	10.4%	10.0%	9.7%	9.3%	9.0%	8.8%	8.5%
3rd	10.2%	10.1%	10.1%	10.1%	10.0%	10.0%	9.9%	9.9%	9.9%	9.8%

Figure 11. Frequency of 1st, 2nd and 3rd digit by number according to Benford's law.

As the table expresses, the frequency for the number 8 to appear in the first digit is 5.1%, for the 2nd digit it is 8.8% and the third it is nearly equal to all other numbers, at 9.9%. Therefore, GSX's stock price should approximate these frequencies per digit.

This time, I looked at **June 2019's IPO stock data through to July 31, 2020** and combining Open & Close prices into one data set for greater statistical significance, GSX's frequency of 8's is approximately **aligned with Benford's expectations**:

6/6/19 (IPO) – 7/31/20	Count	% Frequency	Benford's expected Frequency	Variance from Benford's law
---------------------------	-------	----------------	---------------------------------	--------------------------------

Count of 8's in ##.#x	53	8.31%	10%	-1.69%
Count of 8's in ##.x#	50	7.84%	9.9%	-1.06%
Count of 8's in #x.##	33	5.17%	8.8%	-3.63%
Count of 8's in x#.##	23	3.61%	5.10%	-1.49%

However, **looking at August 1 to present's data**, GSX's frequency of 8's is **152% greater** than Benford's law would predict for the dollar digit and **808% greater** for the 10's digit – *a major red flag*:

8/1/20 – 9/9/20	Count	% Frequency	Benford's expected Frequency	Variance from Benford's law
Count of 8's in ##.#x	4	7.4%	10%	-2.6%
Count of 8's in ##.x#	1	1.9%	9.9%	-8%
Count of 8's in #x.##	12	22.2%	8.8%	+13.4%
Count of 8's in x#.##	25	46.3%	5.1%	+41.2%

Additionally, when GSX's stock price has 4 digits (\$xx.xx), the number 8 should appear in any one of the digits ~33.8% of the time (Summation 5.1%, 8.8%, 9.9%, 10%).

When we look at June '19 through July 20's data, we see very close to that result: 39% of the time, an 8 is contained in any digit of the Open price or Close price.

When we look at **August 1 to September 9's data**, we see an anomaly that is a direct violation of Benford's law: **78% of the time, an open or close contained an 8 digit**. This is **230% more often than the fraud detection mathematical pattern, Benford's law, would predict.**

We can go beyond this and look at only dollar digit 8's (excluding tens-of-dollars). Being the second digit, we would expect an 8 to appear 8.8% of the time. And we get close to that with June 6 2019 through July 31 2020's data: 6.3% of Opens & Closes contain an 8 in the dollars digit. We should expect to see roughly equivalent frequencies for August 14 2020 – September 9 2020 if there is no price manipulation, but we don't: 30% of the time, the dollars digit contained an 8. **This is 341% the frequency that Benford's law, a key fraud detection law of numbers, would predict.**

The below chart highlights the above point, but also importantly shows the frequencies of 8's compared to all other numbers, for both the June '19 – July '20 and the manipulated Aug '20 – Sep '20 timeframes.

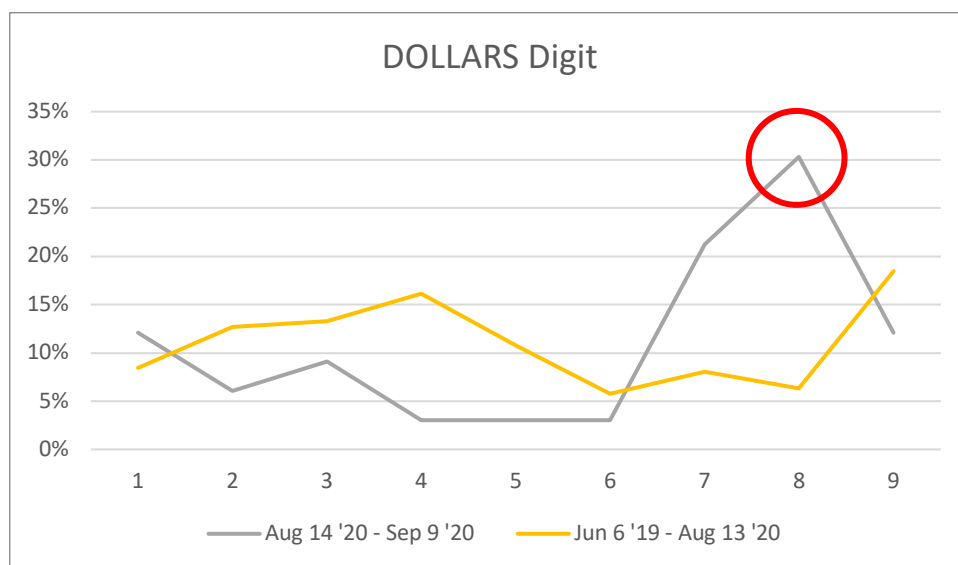


Figure 12. Frequency of numbers by dollars digit (\$#x.##)

We can also look at the frequency of the number 8 occurring across all digits in the Open and Close prices. Benford's law would predict a slightly higher frequency for smaller numbers than larger numbers, but in general, the line should be relatively flat, with a slight downward slope. For the timespan of June 6 2019 (IPO) to July 31, 2019, we see just that: a tight range between 6 – 19% per number, with a downward slope.

However, when we look at August 1 2020 to September 9 2020, we see an extreme outlier: the frequency of 8's is again, significantly greater and leads to an *extreme* upward slope.

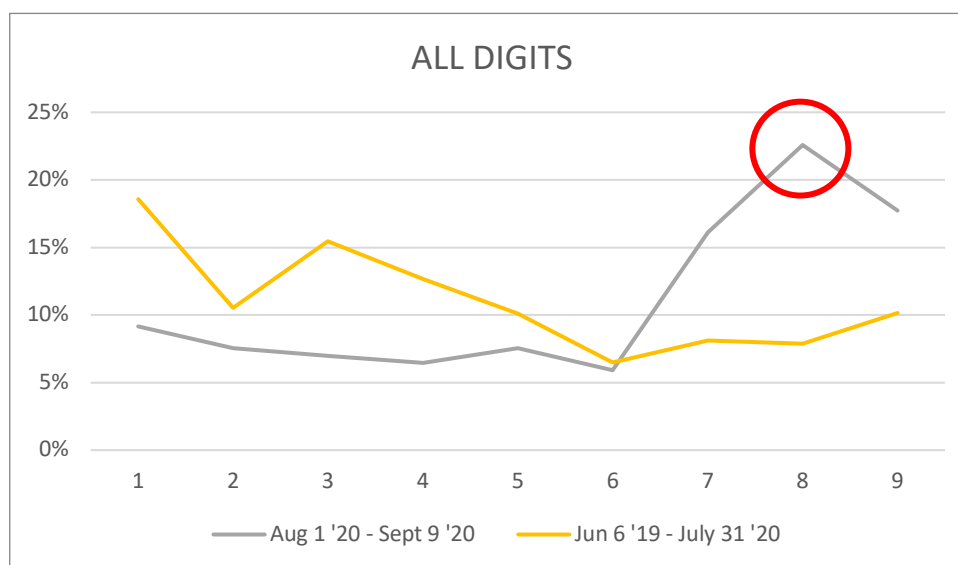


Figure 13. Frequency of numbers by all digits (\$xx.xx)

The frequency of 7's and 9's are also interestingly greater than all other numbers in both Figure 12 and Figure 13. As price manipulation is an imperfect act, there are times when the actor(s) undershoots or overshoots such that they unintentionally land on a 7 or 9.

DAILY PRICE ACTION – THE ARTIFICIAL 8 FLOOR

Going beyond GSX's daily stock Open and Close prices, we can also examine the daily price charts. For the sake of brevity, I have only included the prior 6.5 trading days. However, looking at price patterns for days and weeks prior will further elucidate the unusual pricing action of GSX.

What you will notice in the below charts is how GSX's price falls outside of the "lucky 8" price ranges of \$78 or \$80 during the trading day, but always finishes the day back up within those price ranges:

- Sept 10 low: \$76.01, Close: **\$80.06**
- Sept 9 low: \$76.80, Close: **\$78.59**
- Sept 8 low: \$72.51, Close **\$78.42**
- Sept 4 low: \$76.35, Close **\$80.01** [a close one!]
- Sept 3 low: \$77.23, Close **\$78.75**
- Sept 2 low: \$77.00, Close **\$83.28**
- Sept 1 Open: **\$88.87**, low **\$88.39**, Close \$94.69 (price was pumped in anticipation of September 2nd's Shareholder meeting in which GSX announced that they are being investigated by SEC).

Further, on days like September 9 (Figure 15), September 8 (Figure 16), September 3 (Figure 18), September 2 (Figure 19) and September 1 (Figure 20), you will notice a \$78.00 floor that forms in the afternoon, for which the price resists falling beneath for more than a few minutes, before it is aggressively restored to a small trading range of \$78.00 - \$78.99. This occurred even despite very substantial news on 9/2/20 that the SEC has opened an investigation into GSX.



Figure 14. GSX stock price chart, September 10, 2020.



Figure 15. GSX stock price chart, September 9, 2020.



Figure 16. GSX stock price chart, September 8, 2020.



Figure 17. GSX stock price chart, September 4, 2020.



Figure 18. GSX stock price chart, September 3, 2020.



Figure 19. GSX stock price chart, September 2, 2020.



Figure 20. GSX stock price chart, September 1 – September 2, 2020. Precipitous drop, stops in 80's, falls beneath 80's, then closes day back in 80's (Figure 19).

ADDITIONAL EVIDENCE

Below are screenshots of GSX's stock price on Yahoo Finance's mobile application, as well as social media commentary, which serve to highlight the blatant absurdity of these prices and to remind you that GSX is still not delisted despite such. (Note that these screenshots are a small subset for illustrative purposes; additional can be furnished on a near-daily basis).

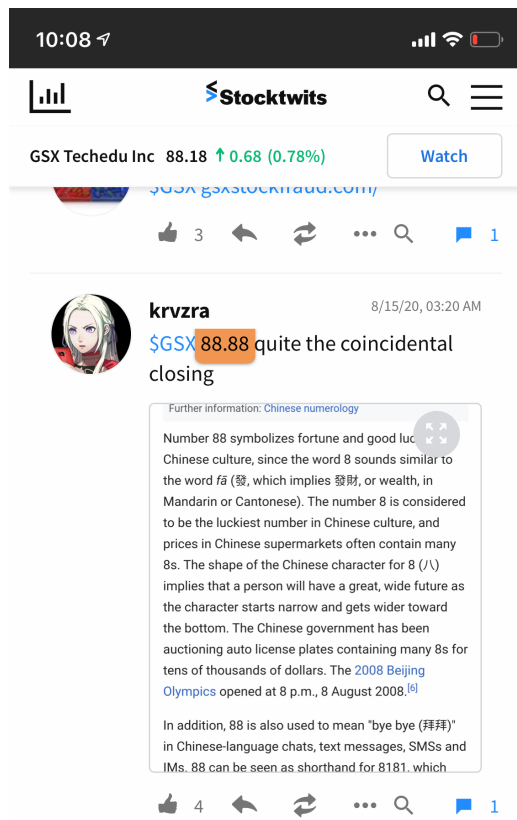


Figure 4. August 15, 2020. \$88.88 close.

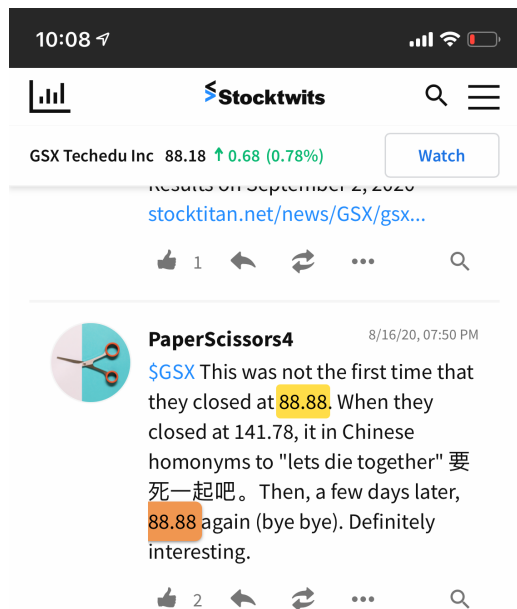


Figure 5. August 16 commentary: Other symbolic numbers that GSX has intentionally closed at (\$141.78).



Figure 6. August 20 close: **\$88.18**
August 20 after hours: **\$88.88**



Figure 7. August 25 after hours: **\$88.00** and close at **\$87.95**

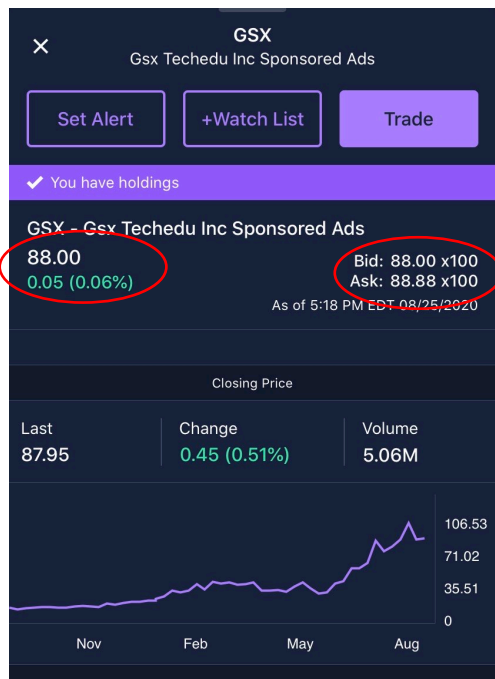


Figure 8. August 25 Close: **\$88.00**
August 25 Ask: **\$88.88**



Figure 9. August 31 pre-market: **\$88.01**

DISCUSSION

The SEC's mission, as stated on the SEC.gov website "is to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation."

(Source: <https://www.sec.gov/Article/whatwedo.html>)

As mentioned in my initial letter to the SEC, dated July 5, 2020, the SEC has with other companies, halted trading or delisted equities that exhibit “unusual or unexplained trading activity affecting the market for {company’s} securities”. This is expected to be applied to all companies, without bias.

Prior to this letter, the preponderance of evidence against GSX was arguably more than adequate to halt and/or delist GSX’s trading on the NYSE.

This letter now presents additional damning evidence. The frequency of the digit 8 in GSX’s Open and Close prices over the past 5+ weeks, and the powerful significance of the number in the Chinese culture, cannot be explained by coincidence and is definitive proof of stock price manipulation. In fact, the often cited Benford’s law, which is used to detect frauds in various disciplines including accounting and stock prices, brings us to a very clear conclusion: GSX insiders are manipulating the stock price to increase the frequency of the Chinese people’s lucky number, 8.

The statistically inexplicable frequency of the number 8, the daily price rallies to 8’s and “8 floors”, and the fact that market manipulation is required for this anomaly to occur are all adequate and direct evidence to call for an immediate halt of GSX’s trading. I respectfully request that you do so immediately.

Sincerely,
Joseph White

Attachment:

1. Excel file containing data and formulas.

Stock open and close prices sourced from Yahoo Finance’s historical data for GSX
(<https://finance.yahoo.com/quote/GSX/history?p=GSX>)